

followed his professional path as a State senator, as attorney general, and now here.

Many of our colleagues will come to the floor in these remaining days of this session to commemorate the tremendous legacy he leaves. It is a legacy of action, not just of words as we have heard today, but action and achievement. He has been a steadfast supporter of family planning and a woman's right to choose, raising awareness and garnering commitment of congressional colleagues for that cause. He has been a champion of equality and justice, exemplified, for example, in his advocacy of the repeal of don't ask, don't tell. He has been a leader on environmental conservation as attorney general of our State, as well as in this body, especially in the fight to protect Long Island Sound, a treasure of Connecticut and the entire Nation.

He was a leader in bringing to the floor of this Chamber one of the first bills on climate change. His legacy will live on in these efforts: the clean air and water he has helped to protect, the urgency with which he has fought to protect our natural treasures in Connecticut and around the country. His spirit of environmental stewardship will inspire generations to come. That ideal of stewardship is also articulated by his remarks here, the stewardship of democracy, of our Republic.

One of Senator LIEBERMAN's signature accomplishments has been the creation of the Department of Homeland Security in which he aimed to consolidate disparate agencies to facilitate interagency communication. In the wake of 9/11, he made that a mission and achieved it as chairman of the Committee on Homeland Security and Government Affairs as well as a leader on the Armed Services Committee. And on that committee, Armed Services, he has championed a strong and vital national defense. That remains essential now as it has been throughout his career.

I am grateful to Senator LIEBERMAN's support for a bill I recently introduced, the End Trafficking in Government Contracting Act, which addresses the serious problem of human trafficking by Federal contractors and subcontractors. I think his support for that measure demonstrates, again, his commitment not only to equality but helping and working with others in this body on a bipartisan basis who share his goals, as that measure has been and was and will be, as is the cause of ending human trafficking and achieving human rights.

Most recently, in a very personal way I observed Senator LIEBERMAN's deep empathy for people who are victims of natural catastrophes. When the recent spate of storms struck Connecticut, Irene and Sandy, I toured with him stricken places, seeing in his eyes and hearing in his voice his sense of how individuals and their families are affected by any kind of natural disaster.

He is a person of heart and of soul—a big heart and a soul that reaches out to people.

I thank him for his great work, his contribution, his unstinting generosity to the people of our State, Connecticut, through all of his years of service in many different positions, in many different ways, in a myriad of places throughout the State and throughout our Nation.

I thank my Connecticut colleague for dedicating his life to public service. I look forward to being with him, if not in this Chamber, in many other places around the country. I continue to admire his great contributions to our country as well as to our State. Thank you, Senator LIEBERMAN.

Mr. CONRAD. Mr. President, I rise today to honor my colleague, Senator JOE LIEBERMAN, who will be leaving the Senate at the end of this term. Senator LIEBERMAN's long career in public service began in the Connecticut State Senate, where he served for 10 years, including three terms as the majority leader. JOE then put his Yale law degree to good use as the attorney general for the State before winning his bid for the U.S. Senate in 1988. He has served in this esteemed body for 24 years, and I am grateful for his dedication and service to our country.

JOE is a true patriot. As Senator, he has made ensuring the security and safety of our Nation his priority. He spearheaded the creation of the Department of Homeland Security in 2002 and has served honorably as the chairman of the Homeland Security and Governmental Affairs Committee. In this position, Senator LIEBERMAN promoted a forward-thinking security strategy of preparing our military to respond to the unique security threats posed in the 21st century. In particular, he has worked to address cyber security issues and prepare our military to respond to evolving warfare tactics.

Senator LIEBERMAN has also worked to ensure that our Nation can stand strong in the face of natural disasters. In 2006, he worked with Senator COLLINS to make the Federal Emergency Management Agency, FEMA, more effective and responsive to communities suffering from the effects of natural disasters. He insisted that FEMA centralize and upgrade its information technology, IT, system to better respond to disasters and the needs of the public.

JOE and I have worked together as members of the Anti-Meth Caucus to fight the methamphetamine epidemic. Senator LIEBERMAN recognizes the threat drugs like methamphetamine pose to the security of our borders, the health of our citizens, and the economic prosperity of our Nation. I was proud to work with him on this important issue.

In 2000, Senator LIEBERMAN ran as the Vice Presidential candidate, becoming the first person of the Jewish faith to represent a major political party on a national ticket. Despite ris-

ing to the top of the ticket as a representative of the Democratic Party, Senator LIEBERMAN has frequently demonstrated his willingness to work across the aisle to achieve his vision.

I respect JOE's commitment to his personal convictions and his hard work on behalf of the people of Connecticut. I thank him for his service to our country and wish him all the best.

I yield the floor, and I suggest the absence of a quorum.

The PRESIDING OFFICER. The clerk will call the roll.

The assistant legislative clerk proceeded to call the roll.

Mr. NELSON of Nebraska. Mr. President, I ask unanimous consent the order for the quorum call be rescinded.

The PRESIDING OFFICER (Mr. CARDIN). Without objection, it is so ordered.

FAREWELL TO THE SENATE

Mr. NELSON of Nebraska. Mr. President, I rise today to thank the people of Nebraska. It is a tremendous honor to have had the opportunity to serve the state for 20 years—8 as Governor and 12 as Senator. The people of Nebraska are generous and hardworking and it has been a true privilege to represent them.

I also want to thank my parents—Birdella and Benjamin. Raising me in McCook, NE they instilled in me the values I have tried to embrace and which serve as guiding principles for me in both public and private.

I especially want to thank my family for their unwavering love and support. As my colleagues know, public service requires our families to sacrifice—sacrifice privacy and sacrifice the ability to determine their own schedule among many other things. And so I sincerely thank my wife Diane, our four kids and five grandkids for their patience and understanding. While it is hard to walk away from this body, I look forward to getting to spend a lot more time together.

As a public official the lens through which I have always tried to view decisions is: how will this policy, this vote or this decision impact my community, my State and my country? This focus and advocacy for my home State has resulted in both praise and criticism at various times but I stand before you today proud of the accomplishments achieved over the last 12 years and grateful for the opportunities afforded to me by the people of Nebraska. Arriving in the Senate in 2001 I recall thinking about what one of my predecessors in this body, Ed Zorinsky, used to say. Senator Zorinsky said that the biggest problem in Washington, D.C. is there are too many Democratic Senators and there are too many Republican Senators. There are not enough U.S. Senators. Unquestionably my proudest moments in the Senate are those efforts that were bipartisan and pursued by a collective motive to get the best possible result while maintaining the dignity of this institution.

Probably the most straightforward example of this work is the compromise achieved by the Gang of 14. As many of my colleagues will recall, in 2005 there were several judicial nominees presented to the Senate for its consideration but which had not yet received an up or down vote. The majority leader at that time, Senator Frist of Tennessee, was considering what became known as the so-called “nuclear option” which would have changed the Senate’s rules so that the minority party couldn’t filibuster a judicial nominee.

There was a great deal of concern about how this would impact the Senate’s longstanding tradition of majority rule while recognizing minority rights—and what this would mean to the way the Senate conducted its business in the future. At that time, myself and Senator Lott convened 12 of our colleagues—6 additional Democrats and 6 additional Republicans. Together we met and exchanged ideas about how to find a sensible way forward that would satisfy all 14 Senators such that each would agree the Senate was dutifully carrying out its “advise and consent” responsibility without unduly restraining the ability of the minority to assert itself in instances when it found a nominee truly and substantively objectionable or unfit to serve.

Ultimately an agreement was reached by this bipartisan group, there was not a rules change and in the midst of a highly partisan environment, the Senate moved forward in a positive way and I believe we did the right thing. Senator Robert Byrd of West Virginia was a critical member of the Gang of 14. In addition to his many, many, many accomplishments—everyone knew then and knows now that there is not anyone more well versed in the history of the Senate or who was more protective of it as an institution. I will never forget after the agreement was finalized Senator Byrd said that he was proud of the work accomplished and that we had “saved the Senate.”

Hearing those words from Senator Byrd was undoubtedly one of the proudest moments of my career. Besides Senator Byrd, I have had the opportunity to serve with so many public servants in this body, and I thank all of them. I would start naming names, but I know I will leave someone out. So I want to thank all present and past Members of the Senate that I have worked with for the occasions we have had to work together so closely.

I also share the sentiment that many of my colleagues have noted in their farewell addresses, and that is the appreciation for the efforts of staff. Over the last 12 years I have worked with an incredibly dedicated and talented collection of individuals. We call on our staff to do a lot of work, often in a very stressful environment. I thank everyone in my office back home and at the office in DC for the work they have done on behalf of the State of Nebraska.

If I were to leave this body with one thought and hope for the future, it would be this: Congress needs to change its math, and by that I mean the Members of Congress should be more concerned about addition and multiplication and less involved in division and subtraction which seems to overtake this institution at times. My hope is that in the process of doing this, Congress and our Nation will have a stronger desire to find solutions for the country’s greatest challenges more so than any effort to try to drive our citizenry apart.

With that, I will say one more time: Thank you to my family, my staff, my colleagues, and most especially to the people of Nebraska.

I yield the floor, and I note the absence of a quorum.

The PRESIDING OFFICER. The clerk will call the roll.

The bill clerk proceeded to call the roll.

The PRESIDING OFFICER. The Senator from Nebraska.

Mr. JOHANNIS. Mr. President, I ask unanimous consent that the order for the quorum call be rescinded.

The PRESIDING OFFICER. Without objection, it is so ordered.

Mr. JOHANNIS. Mr. President, I rise today to pay tribute to my colleague BEN NELSON. In fact, when we visited with each other last night, I said to Senator NELSON that I have spent a significant part of my career following jobs he had done. I was the mayor of Lincoln when BEN NELSON was the Governor of Nebraska, I became the Governor of Nebraska as he was completing his two terms, and then I joined him in the U.S. Senate. Before all of that, I worked with BEN as the Secretary of Agriculture.

I can say from first-hand experience that BEN NELSON always had the best interests of our State at heart. He was enormously hardworking. In fact, I don’t hesitate to admit for a second that when I came to the Governor’s office, I found the State to be in excellent shape. He often joked about how he was tighter than three coats of paint, and I think that is absolutely true.

He tended to business, balanced the budget, and made sure that money was set aside in the rainy day fund because we in Nebraska know there are going to be days where it might rain. He did a great job as Governor. We worked hand in hand on a number of issues when I was Governor and he was a U.S. Senator. When we became colleagues in the Senate, that working relationship continued.

I am very pleased to rise today and say to the people of Nebraska that there was never a time where partisan differences ever impacted or interfered with our ability to work together. Senator NELSON was always looking for a way to move the State forward and move our country forward.

I just wanted to come to the floor today and thank my colleague BEN

NELSON for his service. We appreciate everything he has done. We wish the Senator the very best, and I have a sense we are going to have an opportunity to work together in future years.

Mr. CONRAD. Mr. President, I rise today to pay tribute to and recognize the achievements of Senator BEN NELSON, who, like me, will be leaving the Senate at the end of this year. I consider Senator NELSON, who has represented Nebraska in the Senate since 2000, a friend and an excellent colleague.

Senator NELSON has had a long and impressive career, spanning both the private sector as well as State and Federal Government service. After graduating from law school at the University of Nebraska, Senator NELSON spent roughly two decades working in the insurance industry, both as a legal practitioner and in leadership roles at the Central National Insurance Group, the National Association of Insurance Commissioners, and the Nebraska Department of Insurance.

It was upon this impressive background that Senator NELSON launched his career in public service when, in 1990, as a moderate Democrat, he was elected Governor of Nebraska. As a testament to his dedicated service and popularity, he was reelected to a second term in 1994 after garnering nearly three-quarters of the vote. Nebraskans then sent him to the U.S. Senate in 2000. Senator NELSON was reelected in 2006 in a landslide.

Nebraska and my State of North Dakota share a great deal in common. Both States are populated by residents who value hard work and who possess an independent streak that places pragmatism above partisan politics. Senator NELSON is a product of his Nebraska roots—he brought those same characteristics to Washington and, as a direct result, was able to work across the aisle and within his party to benefit his State in ways more partisan legislators likely never could have done.

Rural States such as ours also face unique challenges, particularly those involving the agriculture industry, which often go unnoticed by those who live in densely populated areas. I have worked closely with Senator NELSON over the years on farm legislation and know firsthand his passion for the industry and his drive to see family farmers succeed. Nebraskans should be very proud of Senator NELSON’s hard work on the Agriculture, Appropriations, and Armed Services Committees.

I will greatly miss having Senator NELSON as a colleague, but I also know that his wife Diane as well as his children and grandchildren will be excited to have him back home in Nebraska. My wife Lucy and I wish Ben and his family many happy years ahead.

I yield the floor and note the absence of a quorum.

The PRESIDING OFFICER. The clerk will call the roll.

The bill clerk proceeded to call the roll.

Mr. WHITEHOUSE. Mr. President, I ask unanimous consent that the order for the quorum call be rescinded.

The PRESIDING OFFICER. Without objection, it is so ordered.

Mr. WHITEHOUSE. Mr. President, I ask unanimous consent to speak as in morning business.

The PRESIDING OFFICER. Without objection, it is so ordered.

CLIMATE CHANGE

Mr. WHITEHOUSE. Mr. President, there are many signs of the fundamental, measurable changes we are causing in the Earth's climate, mainly through our large-scale emission of carbon dioxide from fossil fuels. These are irreversible changes, at least in the short run, so we should take them very seriously.

Over the last 250 years, the global annual average concentration of carbon dioxide in the atmosphere has increased from 280 parts per million to 390 parts per million. That is a 30-percent increase. We have recent direct measurements that the carbon dioxide concentration increased by 15 percent since 1980 when it was 339. In 1980 it was 339 and now it is 390. That is just a dozen years in which the concentration of CO₂ in our atmosphere has increased by more than 50 parts per million. Fifty parts per million is a big shift if one is not aware of the scales we are talking about here. For 8,000 centuries—800,000 years—longer than homo sapiens have existed on the face of the Earth, we can measure that the carbon concentration in the atmosphere has fluctuated between 170 and 300 parts per million. A total range of 130 parts per million has been the total range for 8,000 centuries. We are now outside of that range up to 390, and we have moved 50 points since 1980, in a number of decades. So the consequences are going to be profound, and perhaps no consequence of that carbon pollution will be as profound as the increasing acidification of the world's oceans.

Science, of course, has known since the Civil War era, and most of us understand, that excess carbon dioxide in the atmosphere creates a warmer atmosphere known as the greenhouse effect. There is nothing new about that. But not all of the carbon dioxide emitted by human activity—by our use of fossil fuels—stays in the atmosphere. Carbon dioxide is soluble in water and the oceans cover 70 percent of the Earth. Where the atmosphere is in contact with the oceans, a portion of the carbon dioxide in the atmosphere dissolves into the oceans, reacts with the sea water to form carbonic acid and increases the overall acidity of the oceans.

There is sometimes quarrel and debate about complex modeling of climate and atmospheric projections, but evidence of ocean acidification is sim-

ple to measure and understand. Indeed, even the small noisy chorus of climate change deniers and corporate polluters is noticeably quiet on the issue of ocean acidification because they simply cannot explain away the facts.

National Oceanic and Atmospheric Administration scientists gauge that over the past 200 years, hundreds of billions of tons of carbon dioxide have been absorbed into the oceans. NASA, which is able to put, for instance, a man on the Moon and a Rover on Mars and has reasonably good scientists working there who can accomplish those achievements, reports that:

The amount of carbon dioxide absorbed by the upper layer of the oceans is increasing by about 2 billion tons per year.

NOAA scientists say the oceans are taking up about 1 million tons of carbon dioxide per hour. So in more or less the time my remarks are concluded, the equivalent of more than the weight of the Washington Monument of carbon will have been dumped into our oceans. All of the extra carbon dioxide humans have pumped into the oceans has caused the global pH of the upper ocean water to change—a nearly 30-percent increase in the acidity of the oceans.

As my colleagues can see, the curve is not only moving upward but is steepening. Where is it headed? By the end of this century, it is projected we will have a 160-percent rise in ocean acidity. As we can see, not only are the oceans becoming more acidic, but they are becoming more acidic at a very rapid pace. The rate of change in ocean acidity is already thought to be faster than at any time in the past 50 million years.

I talk, when I give this weekly speech from time to time, about the 800,000 years our planet has had a carbon dioxide concentration between 170 and 300 parts per million and how long a time period that is compared to say humankind having the mastery of fire, humankind having engaged in agriculture, humankind even existing as homo sapiens. It is longer than all of those things. But that is just measuring in the hundreds of thousands of years. We are talking about a rate of increased carbon concentration and ocean acidity climbing faster than at any time in the past 50 million years.

What does that mean? Well, a paper published in the journal *Science*, which is a mainstream, noncrank publication, earlier this year concluded that the current rate of carbon dioxide emission could drive chemical changes in our oceans that are unparalleled in at least the last 300 million years. We are back into geologic time now since we saw that kind of an effect. The authors warn that we may be “entering an unknown territory of marine ecosystem change.” Well, when our range of review is in the hundreds of millions of years and the authors are talking about entering unknown territory, that is really saying something.

Here is what Dr. Peter Brewer, the senior scientist at the Monterey Bay

Aquarium Research Institute, has to say. Let me quote him:

The outcome is very clear that we are in uncharted territory in the entire span of Earth history. The primary cause of this is simply the rate of CO₂ change; we are changing Earth far, far faster than any recorded geologic shift ever.

Repeat: “We are changing Earth far, far faster than any recorded geologic shift ever.”

What does this mean for marine life? Well, as the pH of sea water drops, so does the saturation of calcium carbonate, which is the compound found in the sea water that aquatic animals use for the construction of their shells and of their skeletons. Some sea creatures absorb calcium carbonate directly from the water; others ingest it as food and then through their bodies it works out to build their shells. At lower saturations of calcium carbonate, calcium carbonate is not as available to these species, and it becomes more difficult for them to make their shells; species such as oysters, crabs, lobsters, corals, and the plankton that comprises the very base of the oceanic food web. We have seen this happen in real life already with the disaster that befell the Pacific Northwest oyster hatcheries when acidic water came in and killed off all the juveniles that were being grown.

Over 1 billion people on this planet rely on marine protein as their primary source of protein, and then, of course, there are the countless jobs that depend on fisheries, on tourism, on restaurants, boat building, maintenance, shipping, and the list goes on. The Presiding Officer is from Maryland, which is another ocean State. He is clearly aware of the importance of that ocean economy.

As things get harder for the species to survive and thrive, sooner or later it will get harder for the economies they support. Let me give my colleagues a specific example: the tiny pteropod, a type of snail, which is about the size of a very small pea. It is also known as the sea butterfly because its foot has adapted into two butterfly-like wings which allows it to propel itself around in the ocean. These images show what can happen to the pteropod's shell when the creature's underwater environment is lacking in those compounds and becomes more acidic. That is not good for the pteropods.

Another study compared pteropods incubated in sea water with today's pH to pteropods incubated in water with the acidity and chemical conditions projected for the year 2100. The study found a 28-percent decrease in shell growth. Maintaining their shells against that acidity requires energy—energy that would otherwise go into other biologic processes such as growth or reproduction. So increasing ocean acidity is an external stress that makes it harder for species such as the pteropod to survive.

Who cares about the lowly pteropod? Well, salmon do. Forty-seven percent